

**UNITED STATES AIR FORCE AUXILIARY**

P. O. Box 909  
Bettendorf, IOWA 52722-0909

1 APR 2003

**REPEATER PLAN**

1. **INTRODUCTION:** The mission of communications within Iowa Wing, Civil Air Patrol is to organize and maintain a reliable state wide point-to-point, air-to-ground, air-to-air, and ground mobile radio capability for use in emergencies and for training communications personnel.

2. **PURPOSE:** To establish the guidelines for the communications and operation of ALL VHF-FM repeater systems within Iowa Wing, Civil Air Patrol in accordance with CAPR 100-1 and the Federal NTIA rules. This plan will govern ALL repeater systems, existing and proposed, operated by Iowa Wing Civil Air Patrol and all components, units and/or individual members.

3. **LOCATION PLANNING:** Repeater sites will be chosen to provide the largest service area to the maximum number of operators with the least amount of interference possible. Refer to the attached map for projected/current repeater locations and coverage.

#### 4. TECHNICAL SPECIFICATIONS

4.1 **FREQUENCIES:** The standard frequency pair assignment of 143.900 MHz input and 148.150 MHz output (offset 4.250 MHz) will be used for ALL repeaters, except where unusual conditions exist that prevent operation on the primary frequency pair. Should an exception occur, then the 143.750 MHz input and the 148.125 MHz output could be used. The primary use of the second repeater pair in Iowa will be for the Wing's mobile/airmobile repeater.

4.2 **CONTROLLED ACCESS:** All Iowa Wing voice repeaters will be equipped for dual Continuous Tone Carrier Squelch System (CTCSS) access. All repeaters will be equipped with the standard 100.0 Hz tone for transient operations, and a second coordinated discrete CTCSS tone for normal operations. The use of the 100.0 Hz tone facilitates the ability of mobile stations to selectively access the various repeaters as required to accomplish their missions. Refer to the table below for the CTCSS tone assignments for the Iowa repeaters. Future repeaters must have their unique CTCSS tone coordinated by the Wing Director of Communications within the NCR and adjacent states prior to units turning on their repeater.

Iowa Wing VHF FM Repeaters and Subaudible Tones			
Location	Frequency Pair	Standard Subaudible	Discrete Subaudible
Burlington	143.90/148.15 MHz	100.0 Hz	156.7 Hz
Davenport	143.90/148.15 MHz	100.0 Hz	186.2 Hz
Des Moines	143.90/148.15 MHz	100.0 Hz	127.3 Hz
Cedar Rapids	143.90/148.15 MHz	100.0 Hz	151.4 Hz
Waterloo	143.90/148.15 MHz	100.0 Hz	173.8 Hz

4.3 **TRANSMITTER POWER OUTPUT:** Iowa Wing repeater transmitters will not exceed 50 watts of output power at the antenna input.

4.4 **NTIA TECHNICAL STANDARDS:** VHF FM Radios currently on supply records may be used. Units shall purchase only FM radios that meet the current NTIA wideband and narrowband FM standards. Crystal controlled radios do not meet the current NTIA wideband standards. Contact the Wing Director of Communications for clarification if there are questions about whether a particular radio will meet the standard. Newly purchased personal FM radios shall meet the current NTIA wideband standards and should also be easily convertible to new frequencies (via a computer loader) and the new NTIA narrowband standards.

5.1 BASIC REPEATER PRINCIPLES: A repeater's primary usage is to extend the range of VHF land/mobile station-to-station communications.

5.2 REPEATER USAGE: Any authorized CAP radio station may use the repeaters. In Iowa, all base station and mobiles with power output in excess of 11 watts, must be able to access the voice repeaters using each repeater's distinct CTCSS tone.

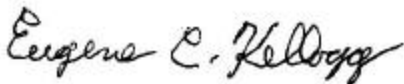
**NOTE:** Aircraft should not use the repeaters unless it is essential for the execution of their mission. When an aircraft must use a repeater, the VHF-FM radio MUST be switched to the channel that has the distinct tone access for the repeater desired. The attached repeater list lists the special tone assignments. The CTCSS tone of 100.0 Hz SHALL NEVER be used by aircraft in flight on repeater input frequencies.

5.3 AIRBORNE OPERATIONS: In times of extended operations beyond the design of the existing Digipeater network, Aircraft with the capability may use 149.895 MHz for Airborne Digipeater relay but only upon authorization of a Mission Coordinator or the IWAG/DC who must first obtain special permission from National Headquarters CAP/DOK. One way digital communications, including still frame video, will be conducted on a frequency coordinated with the conducting Mission Coordinator and/or Communications Unit Leader for the mission.

6.0 FINANCING: No unit or unit member will enter into any agreement or contract with any person, partnership, or corporation which will obligate the Iowa Wing, Civil Air Patrol or any unit for any payments related to the acquisition, installation, maintenance, or continued use of any repeater or digipeater system without the prior WRITTEN approval of the Iowa Wing Commander.

7.0 ENFORCEMENT: This procedure supersedes all previous Repeater Plans or instructions issued by the Iowa Wing, Civil Air Patrol prior to this date. This procedure will remain in effect until rescinded or superseded. Additions or corrections to this procedure should be directed to Iowa Wing Headquarters/DC.

FOR THE COMMANDER



EUGENE C. KELLOGG, Col, CAP  
Iowa Wing Director of Communications

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## IOWA WING REPEATER LOCATOR MAP

